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CHAPTER SEVEN

The Aspen Parkland

CHARLES D. BIRD
RALPH D. BIRD

EXCEPT FOR TONGUES of woodland extending from Alberta into Montana, and from Manitoba into Minnesota and North Dakota, the aspen parkland is a phenomenon of Canada's prairie provinces. Its western bastion is in east-central Alberta, although a narrow strip curves toward the foothills to trail along their eastern flanks. The whole of the parkland from Alberta to Manitoba is a major vegetation zone where groves of aspen poplars, often called "bluffs", are interspersed with prairie, and large stream-valleys are clothed with fairly extensive stands of both aspens and willows. Its terrain is not level or neatly trimmed but varies from gently undulating to hilly countryside in which trees and tangled shrubbery mingle with cultivated fields.

This broad belt of parkland is one of nature's battlegrounds. To the south and east is the prairie, to the north and west the boreal and foothills forests. With each of these, the aspen parkland fights for supremacy; and within its own borders there is a never-ceasing competition between aspen groves and grassland. In biological terminology, the parkland zone is an ecotone, or area of transition.

Early history

Long before Europeans arrived, the Indian tribes of the western prairie and parkland seem to have set fire to the grasslands. In 1798, for example, the explorer and map-maker, David Thompson, wrote: "Along the Great Plains there are very many places where . . . Aspens have been

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Title picture – Aspens in autumn

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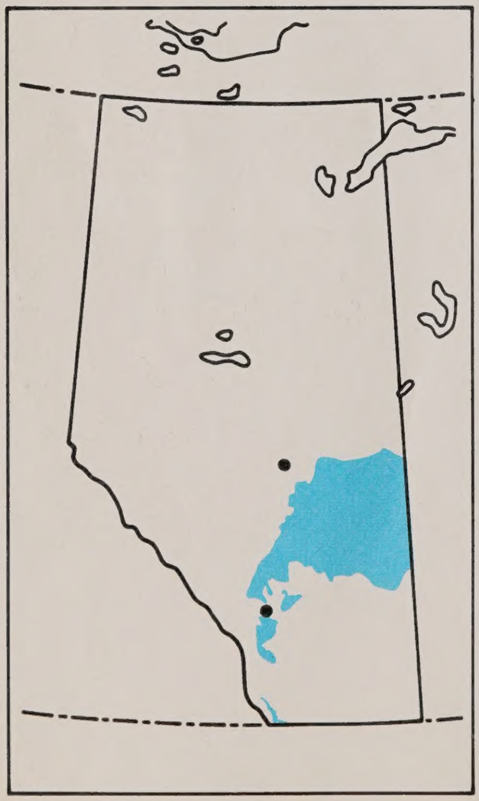
BIRD

over . . . a vast conflagration, extending for one thousand miles in length and several hundred in breadth . . . the annual fires prevent the willows and aspens from covering the country". The early missionaries, as well as explorers and travellers, were impressed by the crackling flames of the fires set every autumn by the Indians and by the bison trampling down "small wood and brush" in the parkland. Throughout the era of the early explorers and the fur traders, it seems likely therefore that the grasslands within the aspen parkland were considerably more open and extensive than they were after the bison disappeared and settlement began.

The fur traders left little or no mark on the vegetation of the parkland. Their interest was fixed on furs. They avoided the southern prairies where there were few pelts to be obtained and where the Blackfoot had formed a powerful and warlike confederacy. Instead they established a number of posts either in the parkland as at Upper Fort Garry, which became Winnipeg, or on the fringes, as at Edmonton; for in the parkland and the northern forests were the fur-bearing animals they coveted and the tribes that could be persuaded to co-operate in bringing in pelts. The fur-bearing animals in these regions were decimated. The countryside itself, except for the Red River Settlement in Manitoba and garden plots and livestock around the forts of the Hudson's Bay Company, was left undisturbed. Even the sale of the Northwest Territories to the infant Dominion of Canada in 1869 did little to affect the parkland, particularly in Saskatchewan and Alberta, until a tide of homesteaders began to pour in, just before 1900.



Parkland zone

Effects of settlement

In the parkland of the three prairie provinces, the homesteaders checked the fires. At first, as long as either oxen or horses were the farm power they tended to break and cultivate only the grassland. In addition, the land survey system divided the whole country into townships of 36 sections of one square mile each, left road allowances, 99 feet wide around each section, set aside sections 11 and 29 in each township as school property and assigned certain lands in each township to the Hudson's Bay Company. Homestead land, being free land, was occupied first and the sections which had been reserved in each township were not sold until later. Because of this patchwork type of settlement, much of the parkland was left in its virgin state. For the same reason most of the road allowances were not disturbed, except for meandering wagon trails and narrow, graded earth roads on the main travelled routes. Under these conditions, with the bison vanished and the yearly fires checked, the aspen woodland occupied grasslands within its own territory and advanced into the southern prairie. In Alberta by 1920 the parkland had extended its range quite considerably to the south and east. But then came the tractor and next the bulldozer.

Tractors, powered first by steam and then by gasoline, appeared on western farms by about 1925. They pulled new and powerful machinery Later, self-powered combines came into common use. The combines and threshers left behind swaths or piles of straw. Fires set for burning the straw and stubble at times escaped into stands of trees. In the same period tractors, either equipped with a cutting bar in front to shear saplings, or with heavy ploughs which they pulled through sparsely treed groves, were used to clear and break the woodland.

The major assault on the aspen groves waited until between 1945 and 1948, when the bulldozer was adopted by western farmers. This machine either pushed over full-grown trees and piled them for burning or else equipped with a blade, cut through saplings as if they were matchsticks

BIRDS OF THE ASPEN PARKLAND

(a) Yellow warbler
(b) Cedar waxwing
(c) Horned grebe
(d) Catbird nest and eggs

(a)

.K.

(b)

.H.

(c)

C.H.

(d)

C.H.

Aspen woodland

M.H.

In this way thousands of acres were cleared. In the meantime, there was a population increase, a massive development of automobile and truck transportation, and an equally massive surge forward in building paved highways and gravelled and graded secondary roads. As a result, roads with deep ditches and high grades – so that the snow would blow off in winter – occupied most of the road allowances in the parkland, destroying much of the native vegetation. On less important roads the ditches have often been abandoned to weeds, but in a number of places chemical herbicides have been used to kill the shrub growth and remaining vegetation. These herbicides may be injurious to animal life; and, in all cases, the removal of the vegetation has affected the wildlife which used to feed on it or make their homes in it. Yet in Alberta, because fires have been checked, the parkland has continued to invade the southern prairie.

The Alberta parkland

In Alberta the parkland covers about 23,000 square miles, or almost one-tenth of the province. In typical areas aspen groves alternate with grassland, while stands of aspen and willow mingled with conifers increase the range of the woodland along wide stream valleys. The elevation of the parkland realm varies from 2,200 feet above sea level near the Saskatchewan border to 5,000 feet in the foothills. The plains are underlaid by Cretaceous and Tertiary sedimentary rocks, with Tertiary gravels capping the Hand Hills. The results of the Ice Age glaciation may be seen in the irregular, gently rolling mantle of moraines laid over parts of the parkland, as the ice sheet stagnated and melted. From this past history arose the rather pleasing undulations and variety in the landscape.

The drainage of Alberta's parkland is eastward through the North and South Saskatchewan River systems. The only stream of any considerable size and length which travels almost exclusively through the parkland is the Battle River. Flowing out of Battle Lake, southwest of Pigeon Lake, its meandering course takes it through Ponoka and then northward to pass between Wetaskiwin and Camrose. From this point it twists and veers past Alliance, Hardisty, and Wainwright to join the North Saskatchewan River at Battleford in Saskatchewan. Lakes seem to be scattered in careless profusion throughout the parkland, varying from large and shallow waters, as at Beaverhill, Buffalo and Sullivan Lakes, to smaller expanses, usually ringed quite delightfully with trees but often surrounded by alkaline shores. Everywhere, too, are sloughs and marshes circled with willows and aspens.

In the parkland short but moderately warm summers and long, cold winters produce a mean annual temperature ranging from 39 degrees in the western districts to 34 degrees near the Saskatchewan border. There can be extremely low winter temperatures of from 50 to 60 degrees below zero, while in summer the mercury can soar as high as 100 degrees. Annual precipitation is in general greater than in the southern prairie, varying from 18 inches in the northwest to 16 inches or lower in the south and east. Winds blow frequently from the east and southeast but prevailing winds are from the west and northwest, the westerly winds, in particular, drying the soil and the plant life. Vegetation on slopes facing northeastward is usually more luxuriant than on those inclining toward the northwest, even though both are equally sheltered from drying by the sun.

Like the climate, the soil influences the type and luxuriance of the vegetation. The major soils are black, or nearly so, on top and contain more nitrogen and organic matter than the brown and dark brown earth of the southern prairie. Parkland soils were developed under fescue grassland, which is another indication that in many places aspen poplars are comparatively recent intruders. Alkaline soils, however, are found in a belt running south from Vegreville and Beaverhill Lake through Sullivan and Dowling Lakes to the prairie. As elsewhere, these soils have a hard pan underneath the surface earth which limits root penetration and holds water on or near the surface until it evaporates. Here the salt content is high enough to prevent or at least retard the growth of many plants.

The vegetation of the aspen parkland with its associated animal life is divided into four communities according to the amount of moisture in the soil: fescue prairie; aspen groves and woodland; creeks and rivers; lakes, marshes and wet meadows. A number of weeds, many of them introduced from abroad by settlers, thrive in more than one of the communities. Animals, too, being mobile, are often not limited to any one area.

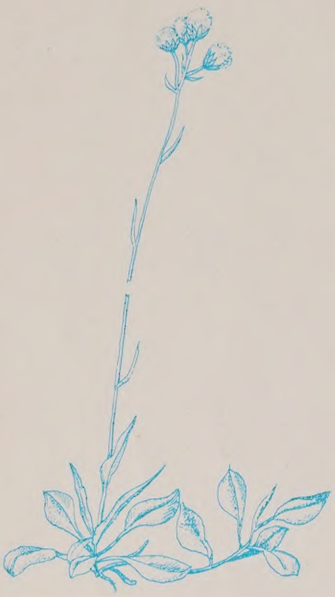
The fescue prairie

Fescue or bunchgrass prairie is the most characteristic grassland of the aspen parkland. Today true fescue grassland is limited to untouched areas or to regions in which there is little grazing. In its virgin state, fescue grass spreads itself in large tussocks up to three feet in height and 20 inches in diameter. Wherever the soil is shallow or the slopes are gravelly or rocky, Parry oat and other grasses replace the fescue.

The fescue grass plant community is imposing. One hundred and forty-eight species of higher plants belong to it, of which 70 constantly occur in any stretches which are several acres in size. There are 20 grasses, three sedges, ten shrubs, 115 forbs and 30 or more mosses and lichens. One-third of the species found in the southern part do not appear in the north and west, probably because in the south soil types are more diversified and the topography rougher.

Settlement has greatly reduced the domain of the fescue prairie. Much of it is now cultivated land and most of the remainder has been

Pasture sage



Pussy-toes

Common Yarrow

altered by grazing or mowing. Under moderate grazing, rough fescue becomes patchy, although it fights a rearguard action on moister and more protected sites. In drier places, it becomes interspersed with a number of grasses, such as june, porcupine, and spear grass and blue bunch fescue along with two species of sedges, *Carex heliophila* and *Carex eleòcharis*. Even in wetter regions, it may be forced to yield ground to other types, such as slender wheat grass and timber oat grass. Heavy and continuous grazing may result in the disappearance of fescue and produce a more or less worthless pasture dominated by sedges, pasture sage and pussy-toes. On the other hand, when rough fescue is mowed, it decreases more or less uniformly over the acreage and becomes less vigorous. The best hay is produced when fescue grassland is mowed not more frequently than every second year.

The shrubs, forbs and flowers of the fescue grassland are found elsewhere in the province. The shrubby cinquefoil and snowberry are characteristic, as are such forbs as common yarrow with its white flowers, cut-leaved anemone, rock cress, creeping white prairie aster, milk vetch, late yellow locoweed and goldenrod. The emblematic flowers of the three prairie provinces bloom everywhere among the fescue, the delicate tints of Alberta's pink prairie rose and Manitoba's blue "crocus" contrasting with the more flamboyant colours of Saskatchewan's tiger lily.

Mammals and birds wander freely between the grassland and the aspen groves and in many cases over the rest of the province. The burrowing rodents, although also found in the southern prairie, are particularly important in the fescue meadows. Among these, Richardson's ground squirrel, the thirteen-striped ground squirrel, the pocket gopher, and one of the principal predators of the three of them, the badger, throw up from their burrows mounds of earth which are often used as dusting places by sharp-tailed grouse. The droppings of the grouse frequently contain seeds of rose and snowberry. These seeds germinate, the seedlings establish themselves on the mounds, and patches of shrubs spread by root suckering. Seeds of aspen, too, blown by the wind, grow into seedlings on these mounds of bare earth, spread by suckering and often develop into aspen groves. In this way the burrowers are at the base of an ecological pyramid, which aids in the advance of aspen woodland into grassland.

Another mammal which in early days ranged into the parkland was the bison. Along with it came the cowbird to feed on the insects which

Tiger Lily

C.H.

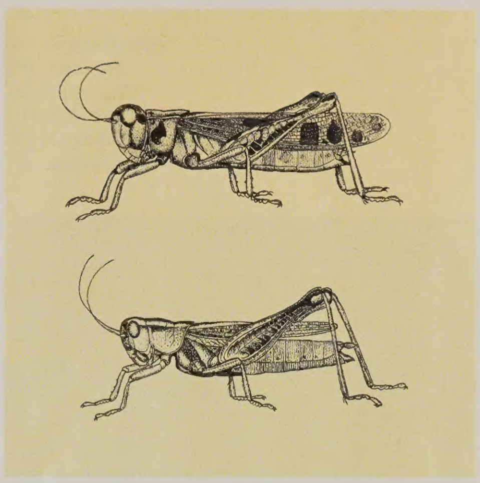
were associated with the "humped cattle". When the bison vanished, this bird transferred its attentions to domesticated cattle. The cowbird drops its eggs into the nests of other birds, which hatch them and rear the young.

The parkland, like the southern prairie, welcomes a host of other birds, such as the song sparrow, the vesper sparrow, the red-eyed vireo, the American goldfinch, the yellow warbler and many other species, but cultivation has destroyed much of the habitat for birds that nest in or feed on the fescue grassland. Two birds have adapted to the changed environment. The horned lark now nests in stubble, summerfallow and pasture, while the meadowlark builds its nests along roadsides and the headlands of cultivated fields. From these habitats, both birds trill their characteristic songs.

The most striking feature of the fescue grassland is the hordes of invertebrate animals. They may total over seven million individuals for each acre of ground. Of this immense multitude – except for roundworms – 98 per cent are insects, with ants as their most numerous component. Wherever there are cultivated fields, many grassland insects have been destroyed but other invertebrates, notably among the cutworms, wireworms and grasshoppers, have increased so greatly as to become pests. Long before settlement began and continuing until about 1900, swarms of Rocky Mountain grasshoppers periodically invaded the parkland and the southern prairie. In an account published in 1859, Henry Youle Hind tells of lying on his back in the country west of Souris, Manitoba, during one of these invasions and looking upward as near to the sun as he could, where he saw "the sky continually changing colour from blue to silver white, ash grey and lead colour, according to the numbers in the passing clouds of insects".

He also relates that: "Those portions of the prairie which had been visited by the grasshoppers wore a curious appearance; the grass was cut uniformly to one inch from the ground . . ."

Since 1900 this particular species seems to have been exterminated, perhaps because its breeding habitat was disturbed by the disappearance of the bison and the replacement of dry prairie grass by green crops. Three other native species of grasshoppers continue on occasion to be almost equally destructive pests – the two-striped grasshopper, the clear-winged grasshopper and the migratory grasshopper. The first of these finds succulent crops and such broad-leaved milky weeds as species of sow thistle, blue lettuce and dandelion to its liking. For egg-laying sites



Clear-winged grasshopper

Two-striped grasshopper

C.H.

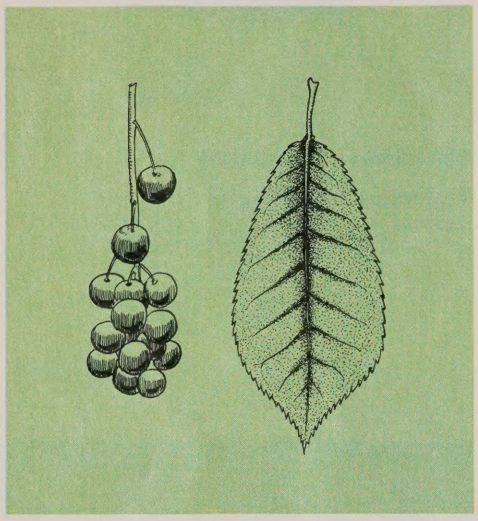
Prairie rose

C.H.

Crocus

it uses disturbed soil along roadsides, the banks of ditches, ridges formed by drifting soil and cultivated fields. The second, the clear-winged grasshopper, feeds mainly on grasses and grain crops and lays its eggs on roadsides and in pastures. The migratory grasshopper deposits its eggs throughout stubble fields and finds its sustenance in crops and weeds.

Other pests to trouble the farmer include the wheat stem sawfly, a native insect which finds the wheat stems an excellent place for the free movement of its larvae. In a somewhat similar way the prairie grain wireworm, red-backed cutworm and striped cutworm flourish in the loose soil of cultivated fields which permits the larvae to move freely while feeding on cereal crops.



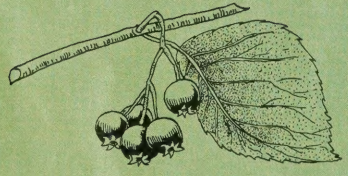
Chokecherry

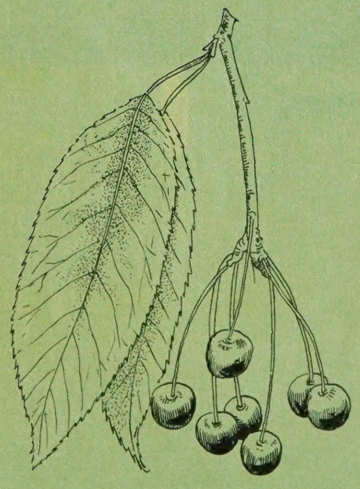
Aspen groves and woodland

During the last century, aspen groves have invaded the grasslands in the parkland. As already noted, once a single aspen has become established on one of the mounds thrown up by burrowing rodents, new trees develop through root-suckering. If nothing adverse interferes, the result is a grove with the oldest and tallest trees in the centre and the younger and shorter trees on the outskirts. This sort of development produces a characteristic rounded profile that one notices as he approaches an aspen grove.

Aspens are unisexual. Each tree therefore is either male, known as a staminate tree, its flowers having stamens only, or female with its flowers possessing only pistils. This second type is called a pistillate tree. Since most groves intruding on the grassland are the product of a single seedling, they usually consist entirely of male or female trees. Another evidence of the common origin of the trees in a grove is that they all come into leaf at the same time. In the younger groves, dense stands are thinned through competition between the trees for moisture, soil and sunlight.

Under favourable conditions, aspens grow about one foot in height each year. Their maximum height and age can be about 110 feet and 120 years, but usually changes in climate or differences in soil interfere with growth so that the height is rarely over 75 feet and 100 years of age is seldom attained. The greatest height is found on moist and deep black earth, the least on dry, exposed sites or on gravelly soils. The diameter of aspens, if measured at chest height, usually increases at the rate of one-tenth to one-fifth of an inch each year. The larger trees in aspen stands of 35, 70, and 110 years of age give diameter measurements at chest height of about six, nine and a half, and twelve inches respectively. Furthermore, as the years go by, fungal activity thins the trees. Records show that in an area of 120 square yards, there were 500 trees in a five-year-old stand, 80 in a 20-year-old grove, and only 3 in a stand that was 110 years old.





Saskatoon

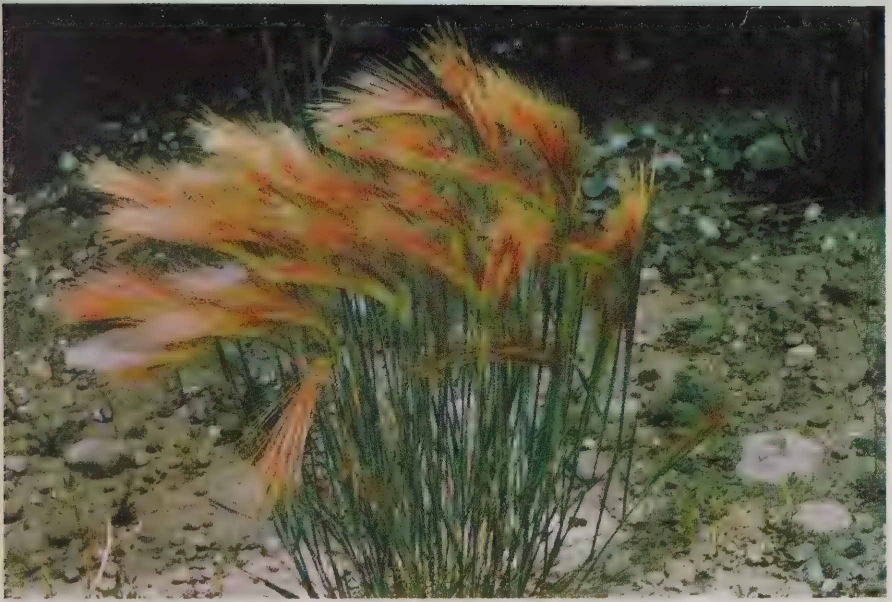
Pincherry

The aspen groves and woodland nurture a fairly widespread community of small trees, shrubs, herbs, ground and tree-trunk plants. Among the small trees and large shrubs are red osier dogwood, beaked willow, saskatoon, chokecherry and pincherry. Shrubs of lower height include, along with prickly rose and snowberry, beaked hazelnut and low-bush cranberry. A few of the tall herbs which are also found elsewhere in the province, are Lindley's aster, northern bedstraw used in pioneer days to stuff bed ticks, pea vine, fringed brome and hairy wild rye. The ubiquitous Western Canada violet and wild lily-of-the-valley along with dewberry and bunchberry decorate the forest floor. Common mosses of the floor are *Mnium cuspidatum*, *Eurhynchium pulchellum*, and *Ceratodon purpureus*. Another moss, *Pylaisia polyantha*, forms stockings on the bases of practically all aspen trees.

FLOWERS OF THE ASPEN PARKLAND

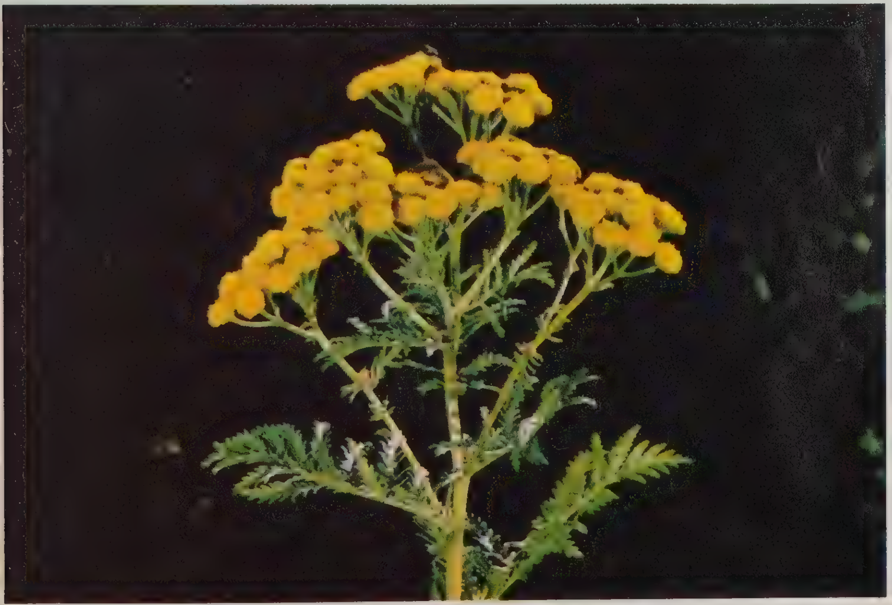
(a) **Wild barley**
(b) **Tansy**
(c) **Bluebells**
(d) **Bull thistle**
(e) **Three-flowered avens**
(f) **Mitrewort**

(a)



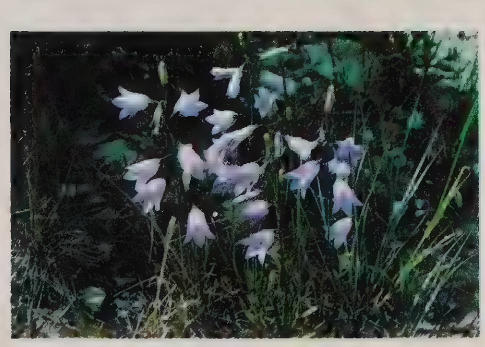
C.H.

(b)



C.H.

(c)



C.H.

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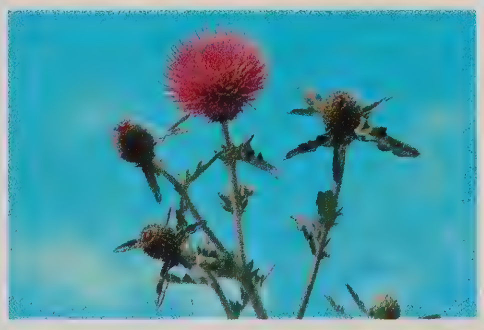
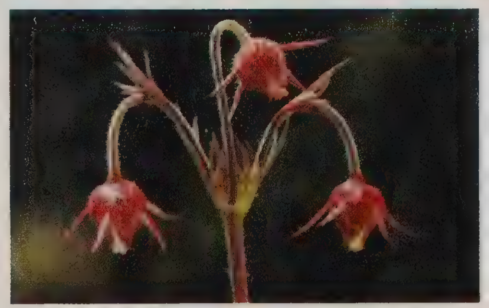


C.H.

(e)



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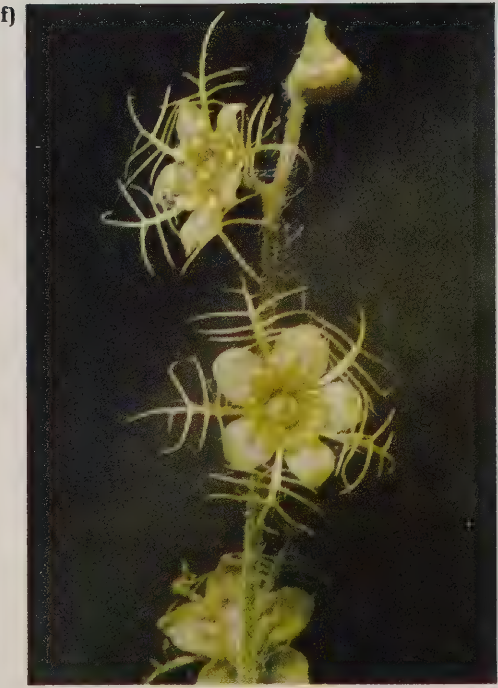
(f)



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Pigeon hawk in flight

C.H.

Among the mammals in the aspen woodland, one of the more numerous and influential is the varying hare, so named because it turns white in winter but more often called the "snowshoe rabbit" because of its widespreading and heavily haired feet that serve as snowshoes in winter. It is noted for its peaks of abundance which occur at intervals of about 10 years. During these peaks hundreds may be found in a few acres.

The varying hare lives in thickets of hazel and saskatoon within the woodland and in dense stands of young aspen which have grown up after cutting or fire. In summer it feeds on a great variety of grasses, herbs and shrubs; in winter its main food is the bark of young aspens up to two inches in diameter. As the snow deepens, it is able to girdle these trees to several feet above the ground, thus killing them. This may result in only beneficial thinning of the stand but, during the peaks of hare abundance, whole stands of young trees may be killed

This hare is an important item in the food supply of a variety of carnivores such as lynx, weasels, foxes, coyotes, great-horned owls and goshawks. In the periods when the varying hare is drastically reduced in numbers, these predators suffer a scarcity of food and, in turn, are reduced in numbers, unless there are enough mice and voles to sustain them. Indians and settlers also find the varying hare a source of food; but the animal is often the host of the bladder tape worm, which is a parasite of foxes, wolves and domestic dogs, whence tuleremia can be transmitted to human beings. In several ways therefore the varying hare is an important ecological factor in the aspen woodland.

Among the many birds in this woodland, the red-eyed vireo suspends well-woven pocket-type nests from branches six to 15 feet above the ground and feeds on insects and spiders. The least flycatcher, which can become quite tame, and the baltimore oriole are among the summer residents. Black-capped chickadees and two species of woodpeckers are year-round inhabitants. The ruffed grouse is frequently seen. Like the varying hare, it is periodic in abundance, fluctuating between less than one pair to six or more pairs in a square mile. This grouse nests among the litter on the forest floor, feeding on green leaves and berries in spring, summer and autumn and on buds and small twigs of aspen, birch and

H.

Magpie alighting

azel in winter. The sharp-tailed grouse, also periodic in its number, ests on the prairies and in the woodland margins, feeding its young vith grasshoppers and other insects, but winters in wooded areas, hav-ng much the same diet as the ruffed grouse. Magpies and pigeon hawks lso nest here.

The slate-blue, keen-eyed goshawk, which has been briefly men-ioned, also winters in the parkland. Besides varying hares its prey in-ludes ruffed grouse, sharp-tailed grouse, squirrels, chipmunks and the nice and voles which abound in the aspen groves. The veery thrush, a ummer visitor only, nests on or near the forest floor. At dusk its rich olling song, phrased in a descending scale, enlivens the aspen groves. ike many other birds and the occasional frog which wanders into the roves, it feeds on insects.

Invertebrates are very numerous in the aspen woodland. Some, like he poplar borer beetle, injure the trees. The poplar borer drills into the eart of the aspens, inserting its eggs under the bark. The wound it makes s quickly invaded by bacteria and fungi, such as the heart rot fungus nd the hypoxylon canker. These organisms may increase so rapidly hat they surround the young larvae and destroy them before they can each living tissue. Egg niches in which the larvae fail to develop subse-uently heal, but stain from the fungal infection may discolor the wood or several feet outward from the wound. Periodically, too, outbreaks of he forest tent caterpillar strip the leaves from large areas of aspen pop-ars for several years in succession. Although the trees leaf out afresh, hey are weakened by the attacks.

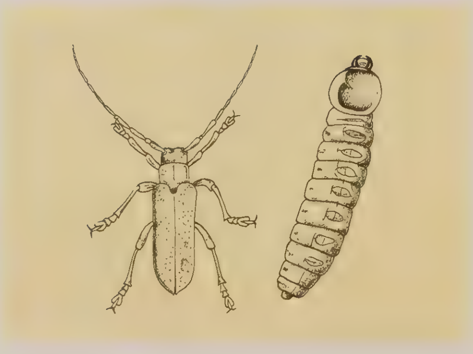
Invertebrates in the leaf mold, as on the fescue grassland, are very umerous. In the latter part of June and early days of July they may each four million individuals in each acre. Instead of ants, the most bundant species are roundworms, snails, segmented worms, centipedes, nites, spiders and insects. Ecologically, the aspen woodland supports n interesting community of shrubs, mammals, birds and invertebrates.

Creek and river communities

he valleys of streams are in general invading fingers of woodland vhich reach far into the parkland. Because these valleys are often fairly

C.H.

Sharp-tailed grouse



Poplar-borer beetle and larva

M.H

Peach-leaf willow

Mare's tail

deep, and so vary in their exposure to the sun, there are differences within them in temperature, soil moisture and humidity. Hence they nurture differing types of vegetation. As early as July 9, 1858, Captain Palliser, during his well-known expedition through the three prairie provinces, wrote a note on the Battle River near Alliance which reads in part, "the northern exposure of the river valley, as usual, was the wooded side, containing poplar, spruce, ash-leaved maple and birch, while the side of the valley by which we approached it was almost bare of wood".

Today's tree and plant life corresponds to Palliser's general statement. Valley slopes facing south and west tend to be dry, warm and occupied by prairie, but those looking north and east are cooler, moister and covered with woodlands in which other trees are mingled with the aspens. Thus white spruce is most frequent along the north-facing slopes of the major valleys, particularly along the Battle River where it reaches from the coniferous forest near Wetaskiwin far out into the parkland. Lower in the valleys, on the wet flats near the streams, are poplars and willows. Here in the northern parkland, balsam poplar dominates, but in the southwest it shares its stands with narrow-leaf cottonwood and black cottonwood. Yellow, sandbar, and peach-leaf willows add diversity. Water or western birch, river alder and a number of herbs complete a fairly rich vegetation. Immediately along the margin of the water there is usually a zone of tall sedges and grasses and shorter rushes. The characteristic aquatic vegetation of creeks and rivers includes algae, mosses, pondweeds, mare's tail and water-plantain. The woodland along the streams nourishes an associated animal life. As in the northern forest and the mountains, the beaver exerts a considerable ecological control on the environment by the building of dams. Low-lying lands are flooded and marshy conditions are created. Willow and aspen are cut down and, if the beaver population is not controlled by predators or trapping, the forest may be denuded for about a hundred yards back from the stream.

Before the arrival of the white man, beaver numbers were kept in balance by lynx, bears, wolves, coyotes and otters. The fur-trade period came close to exterminating the beaver and the animals that preyed on them; but with the enforcement of conservation legislation the number of beavers has again increased.

Muskrats, too, are common, but along the streams of the parkland they live in holes in the banks rather than in houses. Among the predators, mink follow the courses of the streams, feeding on muskrats, mice, voles and fish. Characteristic birds in this habitat are kingfishers and bank swallows. The latter nest in burrows in cutbanks at the water's edge. The usual insects, such as caddis-flies and mayflies, are numerous, and blood-sucking black flies are a pest. Fish are not too varied; pike, suckers, and yellow walleye are the most common species.

Lake, marsh, and wet meadow communities

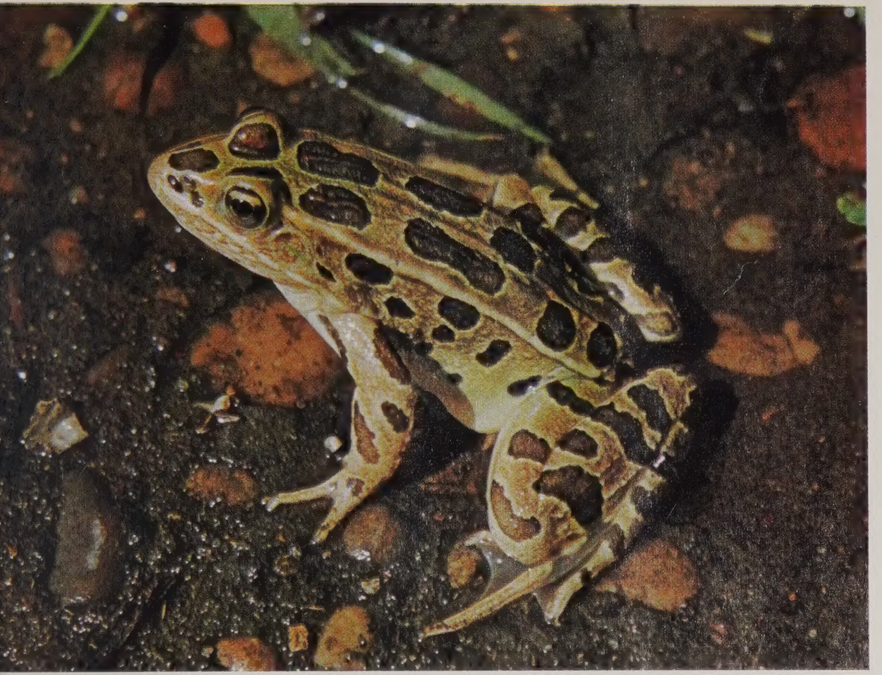
When the ice sheet melted many depressions were left behind. According to their depth and the amount of water collected, these are now lakes, marshes, sloughs, or seasonal wet meadows.

Most of the parkland lakes add to the variety and attractiveness of the countryside. They are appreciated by those who enjoy swimming, boating, water-skiing and fishing; and their banks often provide secluded sites for summer cottages. These lakes vary from deep and permanent water bodies to shallow expanses, some of which are transitory. Most of the lakes are saline so that the exposed shorelines harbour plants, known as halophytes, able to live in soil with a high salt content.

ANIMALS OF THE ASPEN PARKLAND

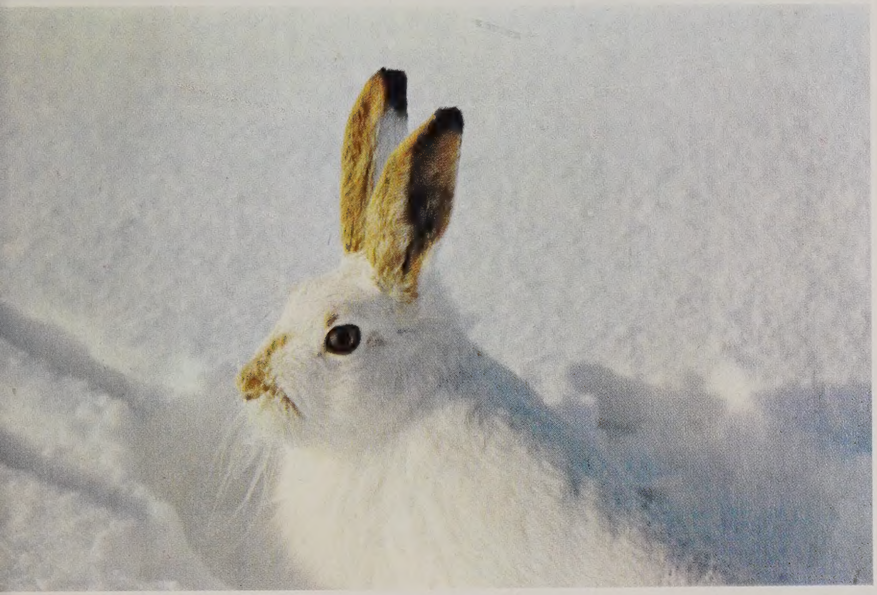
(a) Leopard frog
(b) "Jack rabbit", really a prairie hare
(c) Silverspot butterfly
(d) Coyote hunting mice

(a)



D.B.

(b)



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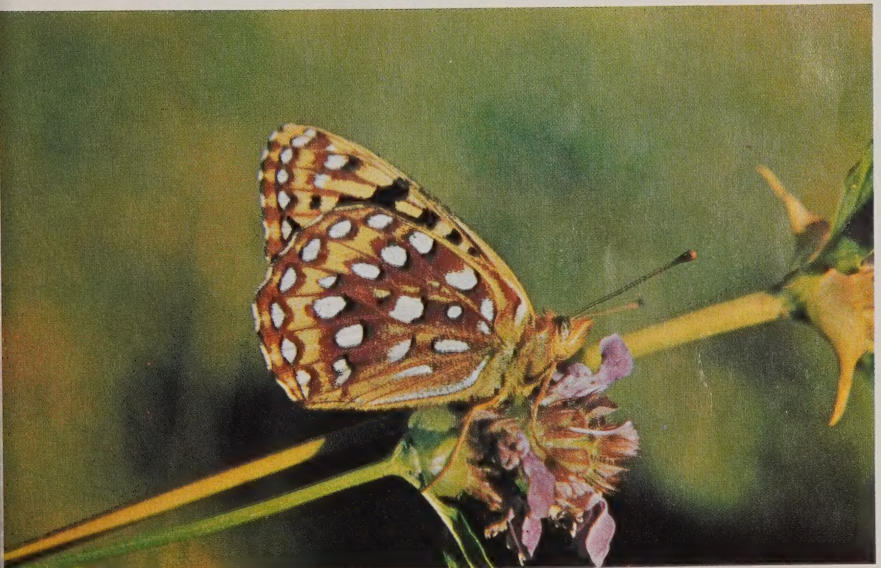

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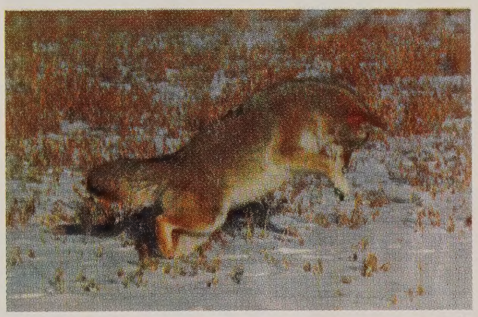


C.H.

Willow-ringed slough

M.H

Among these are salt grass, samphire, sea blite, lance-leaved orache and arrow-grass.

Wave action in the larger lakes has produced firm sandy to gravelly bottoms and shorelines with the corresponding aquatic flora. In small water bodies, such as the sloughs or marshes so frequently found in the parkland, there is less wave action. In consequence, usually dense vegetation ranges from submersed aquatic and emergent aquatic plants to sedge-grass wet meadows, shrubs and poplar woods. Bulrushes and cattails are common but interesting inhabitants of these areas.

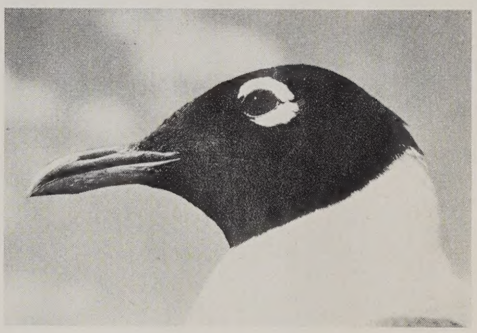
The sedge-grass wet meadow is usually flooded in the spring and summer and dry in the autumn. Rushes, the moss *Drepanocladus aduncus,* and various grasses characterize it. In the parkland, sloughs are usually ringed with willows.

The bird life which finds habitats in or around the lakes, sloughs marshes and wet meadows is almost bewildering in its number of species and individuals. Canada geese still breed quite extensively in the more secluded parts of the parklands and the whole area has been called the main duck breeding region of North America. Mallards, pin tails, shovelers, blue and green-winged teal, gadwalls and baldpates take off from the water at the approach of the visitor and redheads, can vasbacks, ruddy ducks and lesser scaups are to be seen diving for their food.

Geese and ducks are only two of the many types of birds to be found in these habitats. Red-winged and yellow-headed blackbirds, for ex ample, nest among the cattails, bulrushes and reed grasses. During the nesting season they feed almost entirely on insects but after the young have left the nests, they descend in large flocks on the grainfields to gorge themselves with grain, weed seeds and insects. At night they return to the marshes and congregate in roosts which may accommodate thousands of birds. In the marshes are also found the American coot horned and pied-billed grebes and the sora rail. Here, too, the pump-like call of the bitterns mingles with the squawking of black terns and the bubbling song of the long-billed marsh wrens.

As in the southern prairie, many birds, such as the white-fronted goose and the lesser snow goose, pause in the parkland only on thei way to and from their nesting grounds farther north. But a number of shorebirds remain to nest. Among these are the avocet, piping plover spotted sandpiper, willet, common snipe and killdeer. Most striking of all, perhaps, are the great blue herons. These stately birds nest in colonies in the tops of the highest trees available, adding to their huge stick nests each year until, at times, the nests become too heavy for the branches and tumble to the ground. To an observer their flight is majestic, with great black-tipped wings moving in a slow and easy rhythm, slender legs trailing behind and heads tucked in against their shoulders. They can also be seen wading in shallow water, as at Beaverhill Lake, searching for food, or posed in seemingly motionless silhouette until, suddenly, the head darts forward and downward to seize a minnow or a frog. Recently, too, the smaller black-crowned night heron has established itself in the parkland.

Mosquitoes develop in incredible numbers in the sloughs and ponds, and take to the air in June and July, a feature often noted with bitterness by early travellers who claimed that they were of enormous size. Leopard frogs, which likewise occur in numbers in these wet areas, find mosquitoes very palatable, as do many insectivorous birds such as swallows and surface-feeding ducks. Damselflies and dragonflies also consume great numbers but are in turn fed upon by kingbirds, purple martins, black terns, common terns and gulls.



Franklin's gull

Franklin's gull nests in considerable numbers in the parkland. They nest in colonies in lakes or sloughs, building their nests of reeds and grasses. This gull has adapted to agriculture and ranges for considerable distances into the fields. Flocks of them may often be seen following agricultural machinery to pick up insects. In the autumn the young gulls join their parents to work over the fields for grasshoppers and crickets. One investigator found, for example, 64 large black field crickets in the crop and gizzard of a single gull.

The effects of man

Besides checking the annual fires, white settlement put large areas of the parkland under cultivation. Ecologically, cultivation thereby destroyed much of the natural vegetation and disrupted the food cycle running from plant and insect life up to the birds and animals. Bison, elk, moose and mule deer, together with their predators, have been either forced out of the parkland or exterminated. In their place white-tailed deer have expanded their numbers and range. Twin fawns are often produced, and triplets have been frequently recorded.

Similarly, although some species of insects and plants have been reduced in numbers, vigour or range, like fescue grass, others have benefited enormously because of cultivation. The grasshoppers, the wireworms and the cutworms have become pests. Among native plants a number have now multiplied into troublesome weeds as, for instance, the Canada fleabane and the evening primrose.

Man has also introduced so many foreign weeds that most of those which now infest fields, roadsides, and city lots have been brought in from Europe and Asia. Included among these are several species of mustard, peppergrass, Russian thistle, prickly Canada thistle, sow thistle, pigweed and stinkweed.

The settlers naturally brought in cattle and sheep which have often overgrazed the grassland and helped the weeds to spread. The introduction of the ring-necked pheasant and Hungarian partridge has turned out fortunately, but the descendants of, those who, in homesickness, carried across the Atlantic Ocean the starling and the English sparrow often regret their ancestors' nostalgia.

It seems likely that in Alberta, as in the two other prairie provinces, the parkland will remain a separate zone, although its frontiers may fluctuate. Its rolling hills, wooded valleys, cultivated fields, and wave-roughened waters will continue to give it a distinctive individuality.

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